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IS 3207 (1989): Engineers' Drawing Instruments - Rotating Compasses [PGD 22: Educational Instruments and Equipment]



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“Knowledge is such a treasure which cannot be stolen”

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Indian Standard

**ENGINEERS' DRAWING INSTRUMENTS —
ROTATING COMPASSES — SPECIFICATION**

(First Revision)

भारतीय मानक

इंजीनियरी ड्राइंग उपकरण — घूमने वाले परकार — विशिष्ट

(पहला पुनरीक्षण)

UDC 744.342

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NEW DELHI 110002

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards on 3 October 1989, after the draft finalized by the Optical and Mathematical Instruments Sectional Committee had been approved by the Light Mechanical Engineering Division Council.

Rotating compasses is a drawing instrument used by the draughtsmen and engineers to draw small circles on structural and topographic drawings with ease.

This standard was originally published in 1965. This revision is based on further experience gained in the manufacture of drawing instruments and other developments in this field.

The main modifications are:

- a) Tolerances on important dimensions and mating parts have been specified, and
- b) Dimensions of pencil points fixing shanks have been modified from 3 mm to 3.5 mm.

In preparing this standard, due consideration has been given to manufacturing practices being followed in the country and assistance has been derived from DIN 58509-1976 Präzisions-Reisszeuge (P) Fallnullenzirkel (Rotating Compass) issued by the Deutsches Institut für Normung (DIN).

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

ENGINEERS' DRAWING INSTRUMENTS — ROTATING COMPASSES — SPECIFICATION

(First Revision)

1 SCOPE

1.1 This standard covers the requirements of rotating compasses, provided with interchangeable pen and pencil points for engineers' drawing instruments.

1.2 Rotating compasses shall be supplied with the following interchangeable points:

- a) Pen point, plain, shifting or lifting type; and
- b) Pencil point, Type A or Type B.

2 REFERENCES

IS No.	Title
IS 2500 (Part 1) : 1973	Sampling inspection tables: Part 1 Inspection by attributes and by count of defects (first revision)
IS 3211 : 1965	Engineers' drawing instruments, pen points
IS 3214 : 1965	Engineers' drawing instruments, pencil points
IS 3222 (Part 1) : 1966	Instrument screws: Part 1 Fasteners for drawing instruments
IS 4827 : 1983	Electroplated coatings of nickel and chromium on copper and alloys (first revision)

3 MATERIAL AND HARDNESS

3.1 The material for manufacture of rotating compasses shall be rolled, drawn or cast brass (B), nickel silver (NS) or stainless steel (SS).

3.2 The drop needles shall be made from suitable grade of carbon steel wire.

3.3 The material for manufacture of pencil points shall comply with the requirements specified in IS 3214 : 1965.

3.4 Suitable quality spring steel shall be used for the flat springs.

3.5 The material for the drawing nibs of pen points shall be steel having a carbon contents of 0.60 to 0.75 percent or suitable grade of stainless steel.

3.6 The drop needles shall have a minimum hardness of 630 to 690 HV.

3.7 The drawing nibs of the pen points shall have a minimum hardness of 230 HV.

4 DIMENSIONS

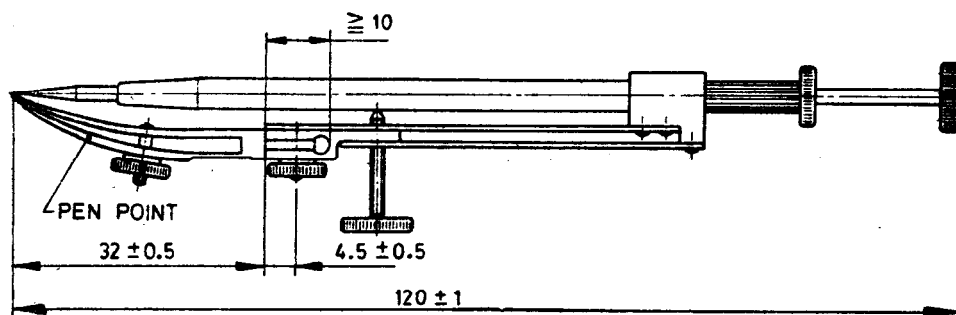
4.1 The dimensions for rotating compasses shall be as shown in Fig. 1.

4.2 The dimensions for pen points shall be as shown in Fig. 1 and they shall comply with other requirements specified in IS 3211 : 1965.

4.3 The dimensions for Type A and B pencil points shall be as shown in Fig. 2 and they shall comply with other requirements specified in IS 3214 : 1965.

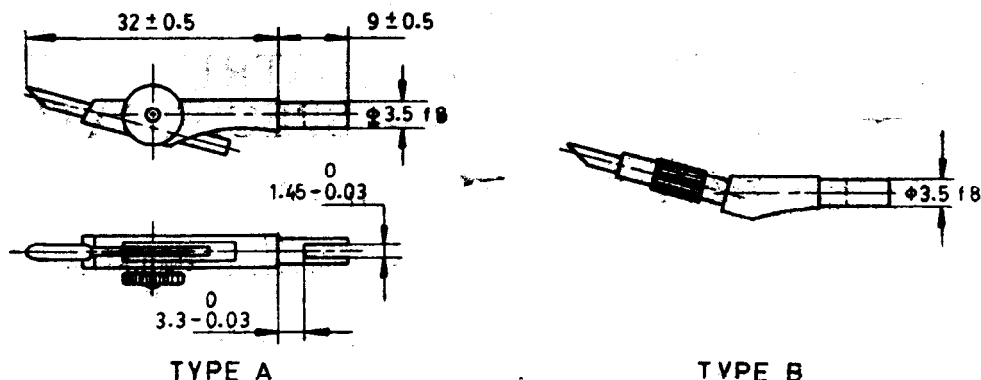
4.4 The tolerances on interchangeable dimensions of pen and pencil points shall be as shown in Fig. 1 and 2 and shall be capable of being locked tight with the locking screw.

4.5 The figures are intended only to illustrate the dimensions and the design details are left to the discretion of manufacturer so long as the specified dimensions are maintained.



All dimensions in millimetres.

FIG. 1 DIMENSIONS FOR ROTATING COMPASS



All dimensions in millimetres.

FIG. 2 DIMENSIONS FOR PENCIL POINTS FOR ROTATING COMPASSES

5 DESIGNATION

5.1 Rotating compasses shall be designated by the name, number of this standard and material.

Example:

Rotating compasses made from nickel-silver (Ns) together with pen point, pencil point and complete with needle and screw shall be designated as:

Rotating Compasses IS 3207-Ns.

6 GENERAL REQUIREMENTS

6.1 The rotating compasses shall have an arrangement that when held on its needle point, the pen point or pencil point revolves around it smoothly and without noticeable play.

6.2 Rotating compasses shall have a screw on the leg carrying pen or pencil point for varying the distance between the pen or pencil point and the drop needle point to permit drawing of circles of different diameters.

7 WORKMANSHIP AND FINISH

7.1 The rotating compasses shall be finished dull or bright.

7.1.1 When rotating compasses are made from brass, they shall be chromium plated to service Grade No. 1 according to IS 4827 : 1983.

7.1.2 When rotating compasses are made from nickel-silver or stainless steel, they shall be polished and buffed.

7.2 The drop needles shall be bright polished, hardened, tempered and ground.

7.3 The drawing nibs of the pen points shall be hardened, tempered, polished and honed.

8 SCREWS

8.1 The different screws used with rotating compasses shall conform to the requirements specified in IS 3222 (Part 1) : 1966.

9 TESTS

9.1 Dimensional Test

Rotating compasses and their attachments shall be tested for conformity with the requirements of dimensions specified in 4, 4.1, 4.2 and 4.3.

9.2 Hardness Test

The drop needles and drawing nibs of the pen point shall be tested for hardness specified in 3.6 and 3.7.

9.3 Performance Test

There shall not be such noticeable backlash which may lead to visible drafting errors because of the drawing instrument after 1 000 screwing and un-screwing operations of the drawing instrument.

10 SAMPLING

10.1 Lot

In a consignment all the rotating compasses of the same designation manufactured from the same material under similar conditions of production shall be grouped together to constitute a lot.

10.2 Unless otherwise agreed to between the supplier and the purchaser, the procedure given in IS 2500 (Part 1) : 1973 shall be followed for sampling inspection. The inspection level, acceptable quality level (AQL) and type of sampling plan to be followed for various characteristics shall be as given 10.2.1 and 10.2.2.

10.2.1 For dimensions, designation, general requirements, and workmanship and finish, a single sampling plan with inspection level IV and AQL of 2.5 percent as given in Tables 1 and 2 of IS 2500 (Part 1) : 1973 shall be followed.

10.2.2 For hardness, a single sampling plan with inspection level II and AQL of 2.5 percent as given in IS 2500 (Part 1) : 1973 in Tables 1 and 2 shall be followed.

11 MARKING

11.1 The rotating compasses and their attachments shall be marked with the manufacturer's name or trade-mark at a suitable place.

12 PACKING

Rotating compasses and their attachments shall

be individually wrapped in paper and then packed in a suitable carton.

12.1 Rotating compasses and their attachments may also be supplied as a part of an instruments set in which case the complete set may be supplied in a suitable box.

Standard Mark

The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The Standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well defined system of inspection, testing and quality control which is devised and supervised by BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

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Doc : No. LMD 20 (5069)

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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